UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,600	08/21/2006	Reimund Piatkowski	4836-19/US/NP	8555

27572 7590 10/28/2008
HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER	
ABRAHAM, AMJAD A	

ART UNIT	PAPER NUMBER
4151	

MAIL DATE	DELIVERY MODE
10/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/567,600	**Applicant(s)** PIATKOWSKI ET AL.
	Examiner AMJAD ABRAHAM	**Art Unit** 4151

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/03/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 17 recites the limitation "said sheets" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 10, 12-13, 19-24, 27-29 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Elliot (USP No. 5,108,691).

4. In claim 10 Elliott discloses a process for preparing and/or setting air and steam-permeable structural members containing a mixture of thermoplastic binder and fibers, optionally with additional foam in the form or flakes and/or granules **(A process for making a thermoformable mat by utilizing a heat transfer medium (steam) to heat and cool the composite material, see abstract)**, said process comprising the steps of: (a) positioning a structural member **(Porous thermoformable mat)** between shaping surfaces **(pair of contoured dies)** in a pressure resistant chamber of a mold having upper tool and lower tool portions **(See claim 1 and figures 1-3 disclosing that mat is placed between upper and lower mold tools.);** (b) deaerating the chamber by applying a vacuum **(See column 1 lines 55-61, disclosing the deaerating process**

that occurs when steam is applied to a molding process. The ratio of steam volume and the ratio of air volume change during the charging process. Essentially, when steam volume increases the air volume decreases, thus deaerating the molding chamber.) ; (c) Pressurizing said vacuum chamber with a vaporous heat-transfer medium **(See column 2 lines 29-44, disclosing the use of superheated steam to pressurize the chamber.)**; and (d) applying a vacuum to said chamber to evaporate the condensed heat-transfer medium. **(See abstract and column 8 lines 15-24, disclosing that the structural member (mat) can be cooled by applying a vacuum at the end of the process to pull ambient air through the mat to eliminate condensed steam.)**

a. In sum, Elliott discloses a process to shape an structural member by (1) placing a structural member (mat) into a pair of contoured dies; (2) deaerating the chamber by applying steam under a vacuum; (3) pressurizing the chamber by adding superheated steam (vaporous heat transfer medium); and (4) applying a vacuum to evaporate the condensed steam.

5. In claim 12 Elliott discloses wherein the structural member has at least two layers. **(See example 4 in column 12, disclosing that the structural member (mat) has at least two layers; one layer being nonwoven polyester reinforcement and the second layer being a foam backed decorative fabric (nylon).)**

6. In claim 13 Elliot discloses wherein said layers are of different materials. **(See example 4 in column 12, disclosing that the structural member (mat) has at least**

two layers; one layer being nonwoven polyester reinforcement and the second layer being a foam backed decorative fabric (nylon).)

7. In claim 19 Elliott teaches wherein said upper and lower mold tools include contoured blocks which form the mold base. **(See claim 1 disclosing the use of complementary contoured die which define the molding space.)**

8. In claim 20 Elliott teaches wherein said contoured blocks are formed from a material selected from the group consisting essentially of aluminum steel, Cast iron or cast aluminum. **(See column 9 lines 14-17, which discloses the use of cast aluminum in the construction of the contoured mold.)**

9. In claim 21 Elliott teaches wherein said mold bases are heated to a temperature to between about 120° to 180 °C. **(See column 2 lines 11-20, disclosing that a prior art method for forming resinated mats preheated the dies from 140 C to 230 C.)**

10. In claim 22 Elliott discloses a process for preparing and/or setting air and steam-permeable structural members containing a mixture of thermoplastic binder and fibers, optionally with additional foam in the form or flakes and/or granules **(A process for making a thermoformable mat by utilizing a heat transfer medium (steam) to heat and cool the composite material, see abstract)**, said process comprising the steps of: (a) positioning a structural member **(Porous thermoformable mat)** between shaping surfaces in a pressure resistant chamber of a mold having upper tool and lower tool portions **(See claim 1 and figures 1-3 disclosing that mat is placed between upper and lower mold tools.)**; (b) deaerating the chamber by applying a vacuum within a range of from 0.5 to 0.01 bar absolute **(See column 1 lines 55-61, disclosing**

the deaerating process that occurs when steam is applied to a molding process. The ratio of steam volume and the ratio of air volume change during the charging process. Essentially, when steam volume increases the air volume decreases, thus deaerating the molding chamber. The prior art disclosed discusses that the steam is delivered at a very low pressure of 2 to 10 psig or .15 to .7 bars); (c) pressurizing said vacuum chamber with a vaporous heat-transfer medium within a pressure range of from 2 to 10 bar absolute **(See column 2 lines 29-44, disclosing the use of superheated steam to pressurize the chamber. And see claim 7 disclosing that steam pressure is between 30 to 90 psig or 2 to 6.2 bars)**; and (d) applying a vacuum to said chamber to evaporate the condensed heat-transfer medium within a range of from 0.5 to 0.1 bar absolute. **(See abstract and column 8 lines 15-24, disclosing that the structural member (mat) can be cooled by applying a vacuum at the end of the process to pull ambient air through the mat to eliminate condensed steam. Inherently a low pressure system can be used to pull ambient air through the system.)**

11. In claim 23 Elliott discloses wherein the structural member has at least two layers. **(See example 4 in column 12, disclosing that the structural member (mat) has at least two layers; one layer being nonwoven polyester reinforcement and the second layer being a foam backed decorative fabric (nylon).)**

12. In claim 24 Elliott discloses wherein at least two of said layers are of different materials. **(See example 4 in column 12, disclosing that the structural member**

(mat) has at least two layers; one layer being nonwoven polyester reinforcement and the second layer being a foam backed decorative fabric (nylon).)

13. In claim 27 Elliott discloses wherein said Upper and lower mold tools include contoured blocks which form mold bases. **(See claim 1 disclosing the use of complementary contoured die which define the molding space.)**

14. In claim 28 Elliott discloses wherein said contoured blocks are formed from a material selected from the group consisting essentially of aluminum, steel, cast iron or cast aluminum. **(See column 9 lines 14-17, which discloses the use of cast aluminum in the construction of the contoured mold.)**

15. In claim 29 Elliot discloses wherein said mold bases are heated to a temperature to between about 120° to 180 °C. **(See column 2 lines 11-20, disclosing that a prior art method for forming resinated mats preheated the dies from 140 C to 230 C.)**

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claims 11, 14-18, 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elliott (USP No. 5,108,691) in view of Reetz et al. (US Pre-Grant Publication 2002/013340).

19. In claim 11 Elliott does not specifically teach wherein the heat transfer per unit mass of the structural member between the vaporous heat-transfer medium and the pressure resistant chamber is lower than 250 m2/s2 per 1 m2 of surface of the structural member and per 1 K of heating the structural member.

b. However, Reetz discloses wherein the heat transfer per unit mass of the structural member between the vaporous heat-transfer medium and the pressure resistant chamber is lower than 250 m2/s2 per 1 m2 of surface of the structural member and per 1 K of heating the structural member. **(See paragraphs [0087, 0088, 0110], disclosing the importance of using a material with a low coefficient of thermal conductivity in the dies. The reason for this is that metal dies absorb too much heat from the super heated steam and thereby limiting the efficiency of the process. Reetz discloses adding RTV rubber, Teflon, or Mylar to a mold in order to lower the heat transfer to the mold. RTV rubber is known to have a low thermal conductivity as seen in Shin-Etsu product guide (made part of this application, Shin-Etsu Chemical Co., Ltd. Pages 16-20) disclosing that RTV Rubber has a low thermal conductivity between the ranges of 0.6 W/m.K to 1.9 W/m.K).** Essentially,

Reetz discloses the claimed invention except for range the heat transfer per unit mass range of 250 m2/s2 or lower. It would have been obvious to one having the ordinary skill in the art at the time the invention was made to use routine experimentation to find a coating material for a metal mold that would limit heat transfer within the claimed range, Since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimal or workable range involves only routine skill in the art. One would have been motivated to find a coating with a low thermal conductivity/heat capacity for the benefit of slowing heat loss from the superheated steam to the metal mold. *In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235.*

c. Elliott and Reetz are analogous art because they are from the same field of endeavor which is using steam to heat up an air permeable preform. At the time of invention, it would have been obvious to the applicant being one of ordinary skill in the art, having the teachings of Elliott and Reetz before him or her, to modify the teachings of Elliott to include the teachings of Reetz for the benefit of eliminating system heat loss through the mold. The motivation for doing so would have been to use a coating which when applied to the surface of a mold would limit the heat transfer from the steam to the mold. This would allow for better steam usage and minimize utility costs. Therefore it would have been obvious to combine Elliott with Reetz in order to minimize heat transfer loss in the molding system.

20. In claim 14 Elliott discloses wherein said shaping surfaces are perforated sheets spaced apart from said pressure resistant chamber thereby defining a steam channeling space. **(See figures 1-5, specifically part number (47) showing perforated holes with steam channeling space.)**

d. With respect to claim 14 Elliott does not specifically disclose wherein said shaping surfaces are perforated metal sheets.

e. However, Reetz discloses wherein said shaping surfaces are perforated metal sheets **(paragraph 0092, disclosing that the perorated sheets are made of metal]**.

f. Elliott and Reetz are analogous art because they are from the same field of endeavor which is using steam to heat up an air permeable preform. At the time of invention, it would have been obvious to the applicant being one of ordinary skill in the art, having the teachings of Elliott and Reetz before him or her, to modify the teachings of Elliott to include the teachings of Reetz for the benefit of having perforated sheets made of metal. The motivation for doing so would have been to use a material which was the same material as the underlying mold. This would allow for better ease of mold construction plus it is conventional in the art to apply a coating to the perforated metal section to eliminate any unwanted heat transfer. Therefore it would have been obvious to combine Elliott with Reetz in order to use metal sheets as the perforated section.

21. In claim 15 Elliott discloses wherein said metal sheets are disposed at a distance of from about 2 to about 20 mm from said pressure resistant chamber. **(See column 9**

lines 42-50, disclosing that the perforated metal sheets cover the entire contact area of the pressure resistant chamber. Elliot clearly shows in Figures 2 that the metal sheets are nearly completely contacting the structural member (mat). Column 9 lines 24-29, discloses that the size and spacing of the perforated metal sheets is dependant on the density of the mat.)

22. In claim 16 Elliott does not specifically teach wherein the shaping surfaces comprise a layer of material having a low thermal conductivity.

g. However, Reetz teaches wherein the shaping surfaces comprise a layer of material having a low thermal conductivity. **(See paragraphs [0087, 0088, 0110], disclosing the importance of using a material with a low coefficient of thermal conductivity in the dies. The reason for this is that metal dies absorb too much heat from the super heated steam and thereby limiting the efficiency of the process. Reetz discloses adding RTV rubber, Teflon, or Mylar to a mold in order to lower the heat transfer to the mold.)**

h. At the time of invention, it would have been obvious to the applicant being one of ordinary skill in the art, having the teachings of Elliott and Reetz before him or her, to modify the teachings of Elliott to include the teachings of Reetz for the benefit of eliminating system heat loss through the mold. The motivation for doing so would have been to use a coating which when applied to the surface of a mold would limit the heat transfer from the steam to the mold. This would allow for better steam usage and minimize utility costs. Therefore it would have been

obvious to combine Elliott with Reetz in order to minimize heat transfer loss in the molding system.

23. In claim 17 Elliott teaches wherein said sheets have a layer thickness of from about 1 to about 30 mm. **(See column 9 lines 42-50, disclosing the layer thickness of the perforated sheets being ¼ inch. ¼ inch is roughly 6.35 millimeters.)**

24. In claim 18 Elliott discloses wherein said layer of material is selected from the group consisting essentially of PTFE, EPDM, epoxy resin or phenolic resin. **(In column 3 lines 41-45 and column 1 lines 10-15, Elliott discloses the use of thermoplastics, thermosets, and phenol-formaldehyde resin in producing the structural members (mats). Obviously one having the ordinary skill in the art at the time of invention would have had the knowledge to use multiple plastic materials such as PTFE, EPDM, epoxy, and phenolic resin. Elliot discloses many times that adhesive materials are preferred and this would have suggested to one having skilled in the art to use epoxy or phenolic resin.)**

25. In claim 25 Elliott discloses wherein said shaping surfaces are perforated sheets spaced apart from said pressure resistant chamber thereby defining a steam channeling space**(See figures 1-5, specifically part number (47) showing perforated holes with steam channeling space.)**, said sheets being disposed at a distance of from about 2 to about 20 mm from said pressure resistant chamber. . **(See column 9 lines 42-50, disclosing that the perforated metal sheets cover the entire contact area of the pressure resistant chamber. Elliot clearly shows in Figures 2 that the metal sheets are nearly completely contacting the structural member (mat). Column 9**

lines 24-29, discloses that the size and spacing of the perforated metal sheets is dependant on the density of the mat.)

i. However, Elliot does not disclose wherein the perforated sheets are metal. **Paragraph 0092, disclosing that the perorated sheets are made of metal]**.

j. At the time of invention, it would have been obvious to the applicant being one of ordinary skill in the art, having the teachings of Elliott and Reetz before him or her, to modify the teachings of Elliott to include the teachings of Reetz for the benefit of having perforated sheets made of metal. The motivation for doing so would have been to use a material which was the same material as the underlying mold. This would allow for better ease of mold construction plus it is conventional in the art to apply a coating to the perforated metal section to eliminate any unwanted heat transfer. Therefore it would have been obvious to combine Elliott with Reetz in order to use metal sheets as the perforated section.

26. In claim 26 Elliot discloses wherein said sheets applied to the mold chamber in a layer thickness of from about 1 to about 30 mm. **(See column 9 lines 42-50, disclosing the layer thickness of the perforated sheets being ¼ inch. ¼ inch is roughly 6.35 millimeters.)**

k. With respect to claim 26 Elliott does not explicitly teach wherein the shaping surfaces comprise a layer of material having a low thermal conductivity.

l. However, Reetz teaches wherein the shaping surfaces comprise a layer of material having a low thermal conductivity. **(See paragraphs [0087, 0088, 0110], disclosing the importance of using a material with a low coefficient of**

thermal conductivity in the dies. The reason for this is that metal dies absorb too much heat from the super heated steam and thereby limiting the efficiency of the process. Reetz discloses adding RTV rubber, Teflon, or Mylar to a mold in order to lower the heat transfer to the mold.)

m. At the time of invention, it would have been obvious to the applicant being one of ordinary skill in the art, having the teachings of Elliott and Reetz before him or her, to modify the teachings of Elliott to include the teachings of Reetz for the benefit of eliminating system heat loss through the mold. The motivation for doing so would have been to use a coating which when applied to the surface of a mold would limit the heat transfer from the steam to the mold. This would allow for better steam usage and minimize utility costs. Therefore it would have been obvious to combine Elliott with Reetz in order to minimize heat transfer loss in the molding system.

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference Kamiyama et al. (USP No. 5,085,814) which discloses a production process for expansion molded products using a permeable porous sheet. The reference Erlenbach (USP No. 3,837,769) which discloses an apparatus used for foam forming thermoplastics. The reference Bruning et al. (US Pre-Grant Publication 2002/0047225) which disclosing a method of making plastic foam article.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMJAD ABRAHAM whose telephone number is (571)270-7058. The examiner can normally be reached on Monday through Friday 8:00 AM to 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AAA

/Angela Ortiz/

Supervisory Patent Examiner, Art Unit 4151